DOCUMENT RESUME

ED 243 769 SO 015 606

| | |
|---|---|
| AUTHOR | Curtis, Douglas C. A.; Staunton, Ted, Ed. |
| TITLE | Money, the Banking System and Monetary Policy in Canada: A Teaching Unit. |
| INSTITUTION | Canada Studies Foundation, Toronto (Ontario). |
| REPORT NO | ISBN-0-920866-02-6 |
| PUB DATE | 83 |
| NOTE | 80p.; For related documents, see SO 015 604-607. |
| AVAILABLE FROM | Dominie Press Limited, Unit 15, 345 Nugget Ave., Agincourt, Ontario M1S 4J4 ($7.95 each, $25.00 for set of four). |
| PUB TYPE | Guides - Classroom Use - Guides (For Teachers) (052) |
| EDRS PRICE | MF01/PC04 Plus Postage. |
| DESCRIPTORS | *Banking; *Economics; *Economics Education; Finance Reform; Financial Policy; Foreign Countries; Inflation (Economics); Instructional Materials; Interest (Finance); Learning Activities; *Monetary Systems; Secondary Education |
| IDENTIFIERS | *Canada |

ABSTRACT

One of a series of teaching units designed to introduce secondary school students to the Canadian economy, this handbook contains instructional materials on Canada's monetary system and policy. Material is organized and presented in terms of specific topic readings and illustrative activities. The topics covered in six sections are money, the money supply in Canada, banking, the banking system in Canada, the relationship between banking and the money supply, and monetary policy. Activities examine such issues as characteristics of a medium of exchange, money as a standard of value, money and the Gross National Product, components of the money supply, bank assets, bank profits, chartered banks, notes and deposits, interest rates, and inflation. (LP)

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# MONEY, THE BANKING SYSTEM AND MONETARY POLICY IN CANADA

## A TEACHING UNIT

BY DOUGLAS C.A. CURTIS

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252 Bloor Street West, Toronto, Ontario. Telephone: (416) 922-4149

ISBN: 0-920866-02-6

Canada Studies Foundation
Printed in Canada 1983

**GRAPHICS**
McDonald Associates. Port Hope, Ontario

**DESIGN**
A. McDonald Robertson

**TYPESETTING**
Northumberland Graphics. Warkworth, Ontario

**PRINTING**
Richard's Printing Ltd. Port Hope, Ontario

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# Preface

Established in 1970 with individual, corporate and governmental support at both provincial and federal levels, the Canada Studies Foundation, currently funded by the Department of the Secretary of State, has actively promoted mutual understanding among the diversity of peoples in Canada. With the conviction that schools can and must provide a knowledge base to help young Canadians become more informed and more active citizens, the Foundation has supported teachers across Canada in the development of books and other learning materials that assist students in one part of Canada to learn more about their fellow Canadians in other parts of our vast country.

This teaching unit is one of a series devoted to 'Understanding Canada's Economy', which has been developed at Trinity College School, Port Hope, Ontario. This Canada Studies Foundation resource centre has been developing curriculum materials in Economics since 1979. The present series contains four secondary school level teaching units. They are *Money, The Banking System and Monetary Policy in Canada, Unemployment and Inflation in Canada, Canada in the International Economy and Women in the Canadian Economy.* The format is a continuation of the activity approach used in the inaugural C.S.F.T.C.S. publication in 1979, *Canada's Economy. An Activity Approach* (Jennings, William E. *et al.*, O.I.S.E. Press, 1981). The units are meant to introduce students to various topics in the Canadian economy through various types of activities. It is expected that the activities will generate considerable classroom discussion and debate and thus lead to the development of further understanding.

Teachers may wish to use these units to augment existing materials or as self-contained units of two or three weeks in duration. The language level and presentation of concepts has been written for a senior audience, particularly economics students.

The author of this teaching unit is currently the Chairman of the Economics Department at Trent University, Peterborough, Ontario.

# Introduction and overview

Money, the banking system and monetary policy have important effects on the performance of the Canadian economy. They provide a structure which makes it easier and more efficient for Canadians to go about their daily economic activities of producing goods and services, or consuming goods and services or both. Canadians are so familiar with a 'monetary economy' and a 'monetary society' that they are probably unaware of the way money and financial institutions operate to affect them. The discussion of concepts, institutions and behaviour presented below is designed to provide a basic awareness and understanding of what money is, where money comes from, how it is controlled and how it influences economic activity in Canada.

The material is organized and presented in terms of specific topics and illustrative examples and activities. The topics covered and the related activities are as follows:

SECTION 1 **What is money?**

A. A medium of exchange
- Activity 1. Money as a medium of exchange
- Activity 2. Characteristics of a medium of exchange

B. A standard of value
- Activity 3. Money as a standard of value

C. A store of value
- Activity 4. Money as a store of value

Summary

SECTION 2 **The money supply in Canada**
- Activity 5. The importance of different components of the money supply
- Activity 6. Relationships between different money supply measures
- Activity 7. The growth of the money supply over time
- Activity 8. The money supply and the level of GNP

Summary

SECTION 3 **Banks, bank deposits, banking operations**

A. Banks as profit-seeking business
- Activity 9. Bank profits

B. A more detailed view of banking operations
- Activity 10. A bank's balance sheet
- Activity 11. Bank asset ratios

Summary

SECTION 4 **The banking system in Canada**

A. Central banks and central banking in Canada
Activity 12. The business of central banking

B. Commercial or chartered banking in Canada
Activity 13. Chartered banking in Canada

C. The bank of Canada and the chartered banks
Activity 14. A banking system

Summary

SECTION 5 **Money, the banking system and the supply of money**

A. Central bank liabilities as money
Activity 15 Central bank money: notes vs. deposits

B. Chartered bank liabilities as money
Activity 16. The supply of chartered bank liabilities

C. The banking system and the supply of money
Activity 17. Measuring the money supply

Summary

SECTION 6 **Monetary policy**

I. Central bank control of the money supply
Activity 18. Changing the money supply

II. Monetary policy targets, GNP, and prices
Activity 19. Potential GNP, actual GNP and unemployment

III. Monetary policy indicators
Activity 20. Nominal interest rates, rates of inflation and real interest rates

IV. Instruments of monetary policy

Summary

# What is money?

When you ask 'what is money?', the answer seems obvious. Almost everyone will answer pennies, nickels, dimes and quarters; and one, two, five, ten and twenty dollar bills are money. But to understand what money is to an economist, and indeed to most Canadians, you must go further than this. You must ask and answer the more difficult question: Why are these things money? This is the key to understanding the concept of money, to identifying things which are money, and to recognizing the importance of money in the economy.

Coins and dollar bills are money in the current Canadian economy because of what you can do with them not because of what they are. Not all metal discs with designs on them and not all pieces of paper printed with complex pictures, portraits and numbers are money. Consider subway tokens, or 'Canadian Tire money'. Are these things money? Can they be used for all the same things as dimes and quarters or dollar bills? The answer is no. Subway tokens may allow you to ride on a particular subway system. 'Canadian Tire money' may allow you to buy things in a particular store. But neither will allow you to buy anything you want to buy anywhere you want to buy it. Nor can you be sure that either will allow you to pay back a loan you have received from a friend or member of your family. In other words subway tokens and 'Canadian Tire money' are not **generally** acceptable as payment for everything you might wish to buy or any debt you need to settle. Coins and dollar bills are generally acceptable for these uses. That is why they are money.

This is the key to understanding and defining money. Something is money because of what it does, not because of what it is. Money does three basic things:

1. it serves as a medium of exchange
2. it provides a standard or a scale for measuring value
3. it provides a store of value

Only those things which do all three of these things are **money**. Consider each of these three concepts in more detail.

## WHAT IS MONEY?

Many different things have at one time or another in history served as a medium of exchange. But as societies and economies developed money evolved. The things used as a medium of exchange needed special characteristics. To be generally acceptable and work efficiently as a medium of exchange a commodity had to be:

1. limited in supply
2. consistent in quality
3. divisible into very small quantities
4. desirable
5. high in value relative to bulk

Because the precious metals, gold and silver, possessed these characteristics they became widely used as mediums of exchange. Problems of purity and weight were largely overcome by minting these metals into coins of specified weight and purity. Later it was recognized that metallic content was not required as long as coins, and subsequently notes, were generally acceptable and recognized as money. This process of evolution has now reached the stage where we use coins, Bank of Canada notes (dollar bills) and bank deposits as money. They serve the medium of exchange function because everybody believes they are acceptable payment. This process of evolution is continuing.

a A MEDIUM OF EXCHANGE

# A Medium of exchange

A medium of exchange is anything that is generally accepted in payment for purchases of goods and services or in settlement of debts. 'Generally accepted' means anybody and everybody will take it in payment and expect others to accept it as well. Such general acceptability is based on an easily understood and widely known relationship between whatever is used as money and the amount of it which must be given to buy goods and services in the economy.

In order to illustrate the idea of 'general acceptability' that underlies the medium of exchange role of money consider the following exercise.

1 *Activity*

# Money as a medium of exchange

Which of the following things do you think would be accepted by just about anybody as payment for a good or service you would like to buy?

1. sea shells
2. United State dollar bills
3. Bank of Canada dollar bills
4. Canadian twenty-five cent pieces
5. deposits in the Bank of Montreal
6. shares of Bell Canada stock
7. a quantity of gold or silver
8. a quantity of diamonds
9. a cow or cows
10. a beaver pelt or pelts

Explain the reasons for your answers.

2 *Activity*

# Characteristics of a medium of exchange

To work efficiently as a medium of exchange the item used must have five basic characteristics namely:

1. limited in supply
2. consistent in quality
3. divisible into very small quantities
4. desirable
5. high in value relative to bulk

These characteristics contribute to efficiency by making the items readliy acceptable and easy to use.

Historically, many items have been used as mediums of exchange. List the desirable characteristics which the following items possess and those which they do not possess.

1. sea shells
2. cloth
3. tobacco
4. glass beads
5. cows
6. camels
7. gold dust (bullion)
8. gold coins
9. cigarettes
10. dollar bills, quarters, dimes, nickels and pennies
11. bank deposits

Do the things we currently use as money have more of the desirable characteristics and fewer disadvantages than the other things listed?

# A standard of value

The second important function of money is to provide a generally recognized measure of value. Money provides the units of measure, dollars and cents. It serves in the same way as meters and centimeters provide standards for measuring weight. The price of a good or service gives the measure of the value that society places on that good or service.

A common standard of measurement allows buyers to compare the different costs of the whole range of goods and services produced in the economy. Such a comparison is essential if buyers are faced with making choices from among a number of things they would like to have, all of which they cannot afford with limited incomes. Similarly, the money prices offered for different kinds of work provide an important basis for choosing whether or not to work, or which job opportunity to choose if several are available. Furthermore, because prices are attached to both work and the purchase of goods and services people can easily calculate the value of work in terms of subsequent consumption of goods and services.

The following exercise is designed to show how the calculation of relative values is made easier when money serves as standard of value.

3 *Activity*

# Money as a standard of value

Suppose there is no money but you know that the following quantities of goods have equal value to just about everbody:

20 movie tickets = 4 pairs of jeans = 5 shirts = 3 tennis racquets = 100 hamburgers

What is the value of a shirt measured in terms of movie tickets?

Is a tennis racquet more valuable than a pair of jeans?

| | 1 movie ticket | 1 pair jeans | 1 shirt | 1 tennis racquet | 1 hamburger |
|---|---|---|---|---|---|
| 1 movie ticket | 1 | 1/5 | 1/4 | 3/20 | 5 |
| 1 pair jeans | 5 | 1 | | | |
| 1 shirt | 4 | 1 | | | |
| 1 tennis racquet | 6 2/3 | | | 1 | |
| 1 hamburger | 1/5 | | | 1 | |

To provide a general set of answers to questions like these complete the above table. Take each item in the left hand column and procede across the row stating the price of that item in terms of the other goods. For example, because 20 movie tickets = 100 hamburgers, one movie ticket has the same value as 5 hamburgers. The complete table gives you commodity prices for each of the five commodities in terms of the other four. In the absence of a generally accepted standard of value this is how values must be compared. If it is difficult with only five commodities think how difficult it would be to compare values of hundreds of thousands of commodities by calculating commodity prices:

| | |
|---|---|
| 1 movie ticket | $ 5.00 |
| 1 pair jeans | $25.00 |
| 1 shirt | $20.00 |
| 1 tennis racquet | $33.00 |
| 1 hamburger | $ 1.00 |

a) Now, is a shirt more valuable than a movie ticket?

b) Is a tennis racquet more valuable than a pair of jeans?

c) Does a common standard of value make comparisons easier?

C A STORE OF VALUE

# A store of value

If people save part of their incomes they accumulate wealth or purchasing power they have not used. Since they will want to use this purchasing power at some later date they need some way to store it. One way is to hold money.

Money has both advantages and disadvantages as a store of wealth or value. Its major advantage when compared to alternatives such as commodities like wheat or gold, or to real capital like land or buildings, or to financial assets like stocks and bonds is that money's price is fixed. The money price of any other asset may go up or it may go down. Holding money as a store of value protects the holder against the risk of losses which would be suffered if the money price of other assets went down.

The disadvantage of holding money as a store of wealth is that it earns no income for its holder. Other assets such as bonds pay interest, or stocks pay dividends, or buildings pay rent or antiques may appreciate in value. Money pays nothing. Indeed in times of inflation, with prices generally rising, the purchasing power of money declines. Even so, because holding money avoids the risks of declines in the prices that go with holding other assets, and because it can be immediately used as a medium of exchange if the need arises, people deliberately choose to give up interest income, dividend income and capital gains and hold some of their wealth as money. People are willing to pay the opportunity cost of interest income or dividend income not received in order to have the security and instant purchasing power provided by money.

4 *Activity*

# Money as a store of value

The following activity is designed to illustrate the use of money as a store of value and its advantages and disadvantages.

Consider the following assets:

gold bars
bank notes and coins
demand deposits
oil paintings
government bonds
Bell Canada shares

a) Which of these things could be used to store purchasing power you did not want to spend today?

b) Which of these things would pay you a money income while you held it?

c) Which of these things might increase in market price while you held it?

d) Which of these things might decrease in market price while you held it?

e) Which of these things could be sold immediately for a guaranteed price not less than what you paid for it?

f) Which of these things is money?

Money is different from other assets because it can be used either as a store of value or as a medium of exchange.

It is important to stress that what is money depends on confidence of acceptability. Notes, coins and bank deposits are money because people are confident these things are acceptable. If that confidence were to disappear, these things would cease to be money.

At times historically, confidence has been established through convertibility. Money could be exchanged at some fixed price for a commodity, usually gold or silver. This is not the case today. Bank deposits can be converted to notes and coin but these monies are not convertible into any commodity at a guaranteed price. Even bank deposits, as we shall see, have only limited convertibility into notes and coin because the banking system only holds a small quantity of notes and coin compared to its outstanding deposits. Thus, it is confidence in general acceptability in exchange, and that alone, which makes something money.

# Summary

We can now reconsider the question: What is money? The answer is that anything which serves at one and the same time as a medium of exchange, a standard of value and a store of value is money. In the present day Canadian economy, bank notes (dollar bills), coins and bank deposits perform this function. That is why they are money.

# The money supply in Canada

As the previous section has established, the money supply in Canada is made up of notes, coins and bank deposits. The next question to be considered is: "How much money is there in Canada?" In other words, what is the size of the Canadian money supply.

When economists talk about the size of the money supply in a country, they talk in terms of **money aggregates.** In other words, the money supply is measured by adding up, or aggregating, its different components. Because different things may be included in, or excluded from, this adding up process, the term 'aggregates' is plural. It means there are a number of different measures of the money supply based on different concepts of what is money and how the money supply should be defined.

The following table illustrates the way money supply is measured in Canada based on different money aggregates. The money aggregates M1, M1B, M2 and M3 are measured by adding to the notes and coins in circulation the amounts held by people and corporations in different types of bank deposits.

## THE MONEY SUPPLY IN CANADA

# Table 1

### The Supply of money in Canada, September 1982
### Measured in billions of dollars

| | | |
|---|---|---|
| | Notes and Coin outside banks | $ 10.7 |
| Plus | Demand Deposits | 14.8 |
| | equals M1 | 25.5 |
| Plus | Chequable Savings Deposits | 8.0 |
| | equals M1B | 33.5 |
| Plus | Personal Savings Deposits | 92.1 |
| | Non-personal notice deposits | 3.4 |
| | equals M2 | 129.0 |
| Plus | Non-personal term deposits | 46.3 |
| | Foreign currency deposits | 10.1 |
| | equals M3 | $185.4 |

Source: **Bank of Canada Review** (Nov. 1982)

As the table shows there are four basic types of bank deposits namely:

1. **Demand deposits** - deposits which the banks agree to pay out in whole or in part immediately at the request of the owner. Chequing accounts and current accounts are demand deposits..
2. **Notice deposits** - deposits on which the bank reserves the right to require several days advance warning before paying out to the owner. Savings deposits are usually notice deposits. The passbook which records the deposit states the regulation "the Bank may request __ days notice of withdrawal".
3. **Term deposits** - deposits which the owner agrees to leave in the bank for a specified period of time or specified term. The bank in turn offers a guaranteed rate of interest for this term. Withdrawal before the maturity date of a term deposit results in an interest rate penalty.
4. **Foreign currency deposits** - deposits with a value measured in foreign currency, for example United States dollars, or British pounds sterling or French francs, whose value in terms of Canadian dollars changes as the exchange rate changes.

These different types of bank deposits are designed to provide different services to their holders and by doing this to capture different sources of funds for the Banks. Demand deposits provide their owners with security and an easy way of making payments through the transfer of deposits by writing cheques. They concentrate on the 'medium of exchange' function of money.

## THE MONEY SUPPLY IN CANADA

Notice and term deposits are more closely related to the 'store of value' use of money than to the medium of exchange use. They offer the holder a rate of interest, or interest income, in return for leaving money on deposit in the bank. Higher rates of interest are paid for a clearer commitment by the depositor to hold the deposit rather than withdraw it. As a result the interest paid on term deposits is higher than that paid on notice deposits such as personal savings and chequable savings. Personal savings deposits on which cheques **cannot** be written pay higher interest rates than savings deposit on which cheques can be written. Because all these deposits have a guaranteed money value they satisfy the store of value use of money. In most cases, however, they cannot perform the medium of exchange use but must be converted to demand deposits or cash for that purpose.

The money aggregate chosen as measure of money supply depends upon what aspect of money is to be measured. If the primary concern is to measure the available medium of exchange, or in other words to measure the amount of money which could be immediately spent to purchase goods and services, then M1 is the likely choice. Some will argue, however, that any bank deposit on which cheques can be written serves as a medium of exchange and thus choose M1B. Still others observe that almost any personal notice deposit can be immediately transferred into a demand deposit. The banks do not usually exercise their right to require notice of withdrawal. This provides a reason for choosing M2 as the measure of money supply and, as a result, treating notice deposits as if they were a medium of exchange.

Others want to make a clearer distinction between money as a medium of exchange and money as a store of value when measuring money supply. They would argue that M1 is the appropriate measure of money as a medium of exchange. M2 or M3 would be seen as measuring money held both as a medium of exchange and as a store of value.

The reason for measuring money supply under any definition is money's influence on national income and the level of prices in the economy. Different money supply measures may have different relationships both to one another and to national income and prices. The Bank of Canada, for example, has argued that the closest relationship exists between M1 and national income (GNP) and prices. Critics of the Bank of Canada have in the past argued that M2 is more closely related to national income and prices. The debate remains unsettled. A careful statistical analysis of the relationship between money aggregates and GNP is required as a first step toward resolving it, but this is difficult in a rapidly changing economic and financial environment.

5 *Activity*

# The Importance of Different Components of the Money Supply

Consider the following money aggregates:

(January 1978, Billions of Dollars)

| | |
|---|---|
| Currency outside banks | $ 7.8 |
| M1 | 20.6 |
| M1B | 28.4 |
| M2 | 68.1 |
| M3 | 97.2 |

**a)** Calculate the following:

1. Bank Deposits as a % of M1 _____
2. Currency outside banks as a % of M2 _____
3. Bank deposits as a % of M3 _____
4. Chequable savings deposits as a % of M2 _____

**b)** Whis is larger the bank deposit part of money supply or the currency part?

6 *Activity*

# The relationships between different money supply measures

Consider the following money aggregates:

| Billions of Dollars | January 1978 | January 1980 | January 1982 |
|---|---|---|---|
| M1 | $ 7.8 | $ 9.1 | $ 10.2 |
| M1B | 20.6 | 23.8 | 25.9 |
| M2 | 68.1 | 91.3 | 123.0 |
| M3 | 97.2 | 136.4 | 175.7 |

**a)** Calculate the following:

1. The ratio M1B/M1 1978 _____ 1980 _____ 1982 _____
2. The ratio M2/M1 1978 _____ 1980 _____ 1982 _____
3. The ratio M3/M1 1978 _____ 1980 _____ 1982 _____

**b)** Do the ratios of M1B, M2 and M3 to M1 remain the same over time or do they change?


| Billions of Dollars | January 1978 | January 1980 | January 1982 |
|---|---|---|---|
| M1 | $ 7.8 | $ 9.1 | $ 10.2 |
| M1B | 20.6 | 23.8 | 25.9 |
| M2 | 68.1 | 91.3 | 123.0 |
| M3 | 97.2 | 136.4 | 175.7 |

7 *Activity*

# The growth of the money supply over time

**Consider the following money aggregates:**

| Billions of dollars | Jan. 1978 | Jan. 1979 | Jan. 1980 | Jan. 1981 | Jan. 1982 |
|---|---|---|---|---|---|
| M1 | 20.6 | 22.2 | 23.8 | 25.2 | 25.9 |
| M1b | 28.4 | 29.9 | 31.3 | 33.1 | 33.3 |
| M2 | 68.1 | 76.9 | 91.4 | 103.6 | 123.0 |

**a)** Calculate the following:

**1.** The % change in M1 from 78-79 _____ 79-80 _____
80-81 _____ 81-82 _____

**2.** The % change in M1B from 78-79 _____ 79-80 _____
80-81 _____ 81-82 _____

**3.** The % change in M2 from 78-79 _____ 79-80 _____
80-81 _____ 81-82 _____

**b)** Has the rate of growth of the money supply (% change from year to year) been steady or variable?

**c)** Have different money aggregates grown at different % rates?

8 *Activity*

# The money supply and the level of GNP

**Consider the following money aggregates and levels of GNP:**

| Billions of dollars | Jan. 1978 | Jan. 1980 | Jan. 1982 |
|---|---|---|---|
| M1 | 20.6 | 23.8 | 25.9 |
| M2 | 68.1 | 91.4 | 123.0 |
| GNP (first quarter of year at annual rate). | 221.1 | 281.7 | 344.5 |

**a)** Calculate the following:

1. The ration of GNP/M1 in 1978 _____ 1980 _____
   1982 _____
2. The ratio of GNP/M2 in 1978 _____ 1980 _____
   1982 _____

**b)** Has the ratio of money supply to GNP stayed the same, increased or decreased over the 1978-1982 period?

**c)** Has the relationship between money aggregates and GNP been different for different money aggregates?

# Summary

This section has examined the measurement of the money supply in the Canadian economy. It has covered the following major points:

1. The money aggregates M1, M1B, M2 and M3 as measures of the money supply.
2. The different types of bank deposits which are included in different money aggregates.
3. The choice of a particular money aggregate as a measure of money supply.
4. The relative size and importance of different components of the money supply.
5. The relationships between and among money supply measures, growth in money supply measures and money supply and national income.

To conclude this treatment of measuring the money supply it is important to explicitly mention some things **not** included in the money supply. Deposits in institutions other than banks, for example, deposits in trust companies, credit unions, savings and loan institutions and so forth are **not included** in money aggregates. These deposits are excluded because, unlike banks these institutions cannot transfer deposits directly to other institutions but must use the banking system to make these transfers. Credit cards are also excluded from the money supply because they simply allow a buyer to postpone payment. Credit cards are not a medium of exchange. The money supply includes only deposits in banks and notes and coins outside the banks.

# Banks, bank deposits, and banking operations

Bank deposits are the largest part of the money supply. Deposits accounted for 62% of the money aggregate M1, and 88% of the money aggregate M2 in 1978. Because deposits are so important, the size of the money supply is mainly determined by the ability of banks to issue deposits. The way in which banks operate, and thus the determinants of bank deposits are the main topics of this section.

a BANKS AS PROFIT-SEEKING BUSINESSES

# Banks as profit-seeking businesses

Banks are private firms set up to 'make money' in the same sense that other businesses do. Other businesses sell goods and services like lawn mowers or automobiles or steel or haircuts. A bank sells banking services such as a safe place to store money, convenience in making payment by cheque and advice on financial matters. Banks also sell the use of money in the form of loans. Both the charges made for services and the interest earned by lending money are revenue or income to the bank but interest earnings are the more important revenue source by far.

A bank 'makes money' or earns a profit on the difference between what it costs it to raise funds and provide services and what it receives for lending funds and charging for services. The major sources of funds to a bank are its depositors. They lend their cash to the bank in return for a deposit. They are willing to accept bank deposits in payment for goods and services. They hold bank deposits as a store of value. In return for this use and holding of bank deposits the bank provides services to its customers at less than the services cost the bank, and in some cases they pay interest to the depositor. The costs of services not covered by service charges and the interest payments to depositors are the costs of funds to the bank.

The bank's major source of revenue is the interest it receives by using the funds it gets from depositors to make loans and buy securities. Banks sell the use of money for a period of time. They make loans to consumers to buy automobiles, or refrigerators, or houses on the condition that the sum of money loaned will be repaid and that interest will be paid on the amount of the loan outstanding. Similar loans are made to businesses to finance their inventories or the building of plants and the purchase of machinery. Banks also lend money to governments and to industry by buying the bonds governments and industry issue to raise money. In each case the money lent ultimately returns to the bank and until it returns the borrower pays interest. Those interest payments are the banks' revenue.

The difference between this revenue and the cost of funds is the source of bank profits. The following simple example illustrates revenues, costs and profits. Consider the following part of Bank R's business.

## a BANKS AS PROFIT-SEEKING BUSINESSES

| | | | |
|---|---|---|---|
| 1. | **Source of funds:** | | |
| | Average annual balance on deposit in accounts of | Mr. X | $1,000 |
| | | Mrs. Y | 5,000 |
| | | Miss Z | 14,000 |
| | Total Funds | | $20,000 |
| 2. | **Cost of funds** | | |
| | Interest paid on deposits at 10% | | 2,000 |
| | Administrative costs of 1% | | 200 |
| | Total costs of funds | | $2,200 |
| 3. | **Use of funds** | | |
| | Loan to ABC Company, average balance over one year | | $18,000 |
| 4. | **Revenue received from use of funds** | | |
| | Interest on ABC loan at 14% | | $2,520 |
| 5. | **Net Revenue earned by Bank R** | | |
| | = Interest received - cost of funds | | |
| | = 2,250 – 2,200 | | |
| | = $320 | | |

The net revenue, or profit, earned by the bank of this part of its business depends mainly on the difference or spread between the interest paid to depositors and the interest earned on loans.

# 9 *Activity*

## Bank profits

Consider the following example of a simple bank balance sheet:

XYZ Bank

| Assets | | Liabilities | |
|---|---|---|---|
| Cash | $1,000 | Deposits | $5,000 |
| Loans & Securities | 4,000 | | |
| | $5,000 | | $5,000 |

1. If the net cost to the bank of attracting customer deposits and holding them is 10%, what is the bank's cost of funds?
2. What rate of interest must the bank earn on its loans and securities to just cover the cost of its funds?
3. Suppose the cost of funds rises from 10% to 12%. What rate of interest must the bank earn on its loans and securities to just cover the cost of its funds?
4. Even if it charged the same interest rate, how could it adjust its assets to break even?

b A MORE DETAILED VIEW OF BANKING OPERATIONS

# A more detailed view of banking operations

A more complete picture of a bank's business is illustrated by the following simplified balance sheet. The items listed as liabilities are the bank's debts and its source of funds. The asset side of the balance sheet shows how the bank has used its funds.

**The Bonanza Bank**
**Balance Sheet for November 30, 198?**

| Assets (millions of $) | | Liabilities (millions of $) | |
|---|---|---|---|
| (a) Bank notes and coin | 5.0 | (i) Personal savings deposits | 30.0 |
| (b) Treasury bills | 7.5 | (j) Non-personal term and notice deposits | 10.0 |
| (c) Government of Canada bonds | 2.5 | (k) Demand deposits | 7.0 |
| (d) Consumer loans | 15.0 | Total privately held deposits | 47.0 |
| (e) Business loans | 12.5 | (l) Government of Canada deposits | 3.0 |
| (f) Mortgages | 5.0 | Total Canadian dollar deposits | 50.0 |
| (g) Canadian securities | 3.5 | | |
| (h) Bank premises | 1.5 | (m) Shareholders equity | 2.5 |
| Total Assets | $52.5 | | $52.5 |

The balance sheet illustrates two major sources of funds and three major uses of funds. The sources of funds, from the liabilities or right hand side of the sheet, are:

1. Deposit liabilities to customers (i+j+k+l)
2. Capital funds from shareholders (m)

The uses of funds, from the left hand or asset side of the sheet are:

1. reserves and liquid assets (a+b+c)
2. loans and less liquid assets (d+e+f+g)
3. capital assets (h)

While this balance sheet provides a more complete and therefore more complex picture of a bank's business, the basic principle developed earlier still applies. The bank is in business to 'make money' or earn a profit. It does this by receiving more income from its assets than it has to pay in expenses to maintain its liabilities.

## b A MORE DETAILED VIEW OF BANKING OPERATIONS

The balance sheet shows in more detail how the bank goes about its business. The bank's sources of funds, deposits, have already been discussed in the previous section on measuring the money supply. How the bank uses its funds requires similar discussion.

In using its funds to earn income the bank must always remember the terms on which it has acquired these funds. The main source of funds is customer deposits. Customers may ask for cash; in other words, withdraw their deposits on demand or at very short notice. The bank must be prepared to meet these demands. For this reason, the bank must hold some of its funds in cash to satisfy its customers' day to day requirements. Notice that the Bonanza Bank is holding cash equal to 10% of its deposit liabilities. These are called its **cash** or **primary reserves.**

In a well developed banking system, banks need only very small cash reserves to meet their customers' needs. This is because people generally find it more convenient to use bank deposits as money than to use cash. Thus, while some people are withdrawing cash to make payments, others are depositing cash into their accounts. In the economy as a whole, as long as the ratio of cash to bank deposits does not increase sharply and continuously, withdrawals of cash and deposits of cash roughly offset each other. This means a bank needs only enough cash to cover differences in its customers' withdrawal and deposit habits, plus a little for unexpected developments.

After it has met its basic cash reserve needs the bank can turn to the main business of purchasing assets which will yield income. Some of the assets it buys are highly **liquid,** easily and quickly sold for cash at a very stable price, like treasury bills and government bonds of short maturity. These provide a second line of defence or **secondary reserve** should the need for cash be higher than expected. The Bonanza Bank is holding secondary reserves of $10 million, equal to 20% of its deposit liabilities. It earns interest income on these assets but their yield is lower than the yield on loans because of their high liquidity.

## b A MORE DETAILED VIEW OF BANKING OPERATIONS

Loans to consumers and to businesses are the assets which provide most of the bank's income. This is the real business of banking. The bank lends money to people to finance their purchases of all sorts of goods and services; automobiles, boats, television sets, household appliances, vacations and so forth. Businesses borrow money to buy raw materials, machinery and equipment and to cover the costs of goods they have produced but not yet sold and therefore hold as inventories. Both consumers and businesses finance the costs of land and buildings through mortgages. Most of these loans are **less liquid assets** since the bank cannot quickly or easily convert them into cash without at least causing a lot of inconvenience for its borrowing customers. Because there is less liquidity, higher administrative cost and greater risk of default associated with these loan assets, they yield higher rates of interest income than liquid assets yield.

These different types of assets held by the bank illustrate the limits on its operations. Even though the bank's objective is to earn a profit it cannot put all its funds in the highest paying assets available. First, it must remember its commitment to its depositors to pay cash if they want cash, and hold some cash reserve for that purpose. Cash does not yield any income to the bank. Second, it must provide for the possibility that the demand for cash may unexpectedly change over time, and hold some highly liquid but lower yielding assets against this possibility. Third, having made these provisions it can get down to the real business of banking, namely lending money to its customers. This loan business is, however, limited to the availability of funds after the first two requirements are met.

Thus, the need to hold cash reserves against its deposit liabilities limits the total of bank lending. Banks cannot place all their funds in earning assets because then they would be unable to meet depositors' demands for cash. It is this need to hold cash, combined with the limited amount of cash available in the economy, that limits the total bank deposits the banks can issue.

10 *Activity*

# A bank's balance sheet

Consider the following bank's business:

| | | |
|---|---|---|
| 1. | cash in the vault | $ 500 |
| 2. | savings deposits | 3500 |
| 3. | business loans | 1500 |
| 4. | government securities | 500 |
| 5. | demand deposits | 1000 |
| 6. | consumer loans | 2500 |
| 7. | notice deposits | 500 |

1. Enter these items in the appropriate place in the bank's balance sheet.

ABC Bank

| Assets | Liabilities |
|---|---|
| | |

2. Calculate the total of:
   1. deposits
   2. primary reserves
   3. loans and securities
3. Calculate the banks's primary reserve ratio

11 *Activity*

# Bank asset ratios

Consider the following example of a bank balance sheet:

LMN Bank

| Assets | | Liabilities | |
|---|---|---|---|
| Cash | 2,000 | Customer Deposits | 40,000 |
| Treasury Bills and short term bonds | 4,000 | | |
| Loans to customers | 36,000 | | |
| | 40,000 | | 40,000 |

**(a)** What percentage of its total assets does the bank hold as cash?

**(b)** What percentage of its total assets does the bank hold as **liquid assets** ?

**(c)** What is the bank's liquidity ratio? In other words, the ratio of cash plus liquid assets to total deposit liabilities?

**(d)** What percentage of total assets does the bank hold as loans to customers?

# Summary

This section illustrates several basic features of the operation of a bank, namely:

1. Banks are businesses operating to earn profits.
2. Bank profits come mainly from the difference between the cost of attracting and holding bank deposits and the interest income earned on securities and loans.
3. Banks must hold some cash in order to meet the day to day demands of depositors to withdraw cash.
4. In buying assets which earn income, such as securities and loans, banks must choose between high interest income and high liquidity in order to be prepared for unusual depositor demands for cash.
5. The total of bank deposits a bank can issue is determined and limited by its need to hold cash equal to a fraction of its deposit liabilities.

# The banking system in Canada

Different countries have different types of banking systems. The banking system in Canada is made up of one **central bank** and a relatively small number (11 in 1980) of **commercial** or **chartered banks.** Each of these chartered banks operates under the rules and regulations set out in the Bank Act, a piece of federal government legislation. Each of these chartered banks operates branch offices in different parts of the country. Through these branch offices the chartered banks carry on the daily business of banking, namely; receiving customer deposits, transferring deposits at the request of customers, lending money, collecting on loans previously made and so forth.

In the United States, the institutional arrangements are different. The **central bank** in the United States is the **Federal Reserve System** or 'The Fed' which operates on the basis of twelve Federal Reserve Districts. Commercial banking in the United States is conducted by thousands of independent or unit banks established under either federal or state law. Branch banking as we know it in Canada is allowed in some states but not in others. For the most part it is the local independent bank that provides banking services to the public.

The purpose of this section is to present and describe the basic institutional structure of banking in Canada. This involves three steps, namely:

1. Defining and illustrating the business of a **central bank** in the Canadian system.
2. Defining and identifying the **chartered banks** in the Canadian system.
3. Defining the relationship between the central bank and the chartered banks.

The relationships between these financial institutions and the public determine the money supply.

a CENTRAL BANKS AND CENTRAL BANKING

# Central banks and central banking

A central bank differs from other banks in one vital way. A central bank does **not** operate for the purpose of making a profit. Instead it conducts its business in a way that will affect the financial position and behaviour of other banks in the system. The central bank usually does earn a profit but that is not the reason for its existence. It is established and it operates to control the banking and financial system.

In Canada, the central bank is The Bank of Canada located in Ottawa. The Bank of Canada is owned by the Government of Canada. It performs many 'normal central banking functions'. For example, it is the bank used by the Government of Canada to hold deposits and make payments. The Bank of Canada is also the bank used by the chartered banks in the banking system for holding deposits and making payments; it is the banker's bank. It also stands ready to lend cash to the chartered banks in the system if they are unexpectedly caught short. In these activities the Bank of Canada is much like any bank, taking deposits, transferring deposits to make payments, paying out cash on demand and even lending money. But its customers are the banks in the banking system and the federal government.

This banking business of the Bank of Canada can be illustrated by looking at a simple balance sheet for the Bank. In January 1982 the Bank of Canada's balance sheet was as follows:

**Bank of Canada**
**January 1982**
(millions of $)

| Assets | | Liabilities | |
|---|---|---|---|
| Government of Canada securities | 16,011 | Notes in circulation | 10,560 |
| Advances (loans) to banks | 50 | Deposits of Gov't of Canada | 48 |
| Foreign currency assets | 186 | Deposits of chartered banks | 6,075 |
| Other assets | 2,161 | Foreign currency liabilities | 36 |
| | | All other liabilities | 1,689 |
| | 18,408 | | 18,408 |

Source: Bank of Canada Review, October 1982

## a CENTRAL BANKS AND CENTRAL BANKING

Notice that as a bank for the Government of Canada the Bank of Canada held government deposits of $48 million at the end of January 1982. As a 'banker's' bank it both held deposits equal to $6,075 million and had outstanding loans to the banks equal to $50 million. The Bank of Canada was also the source of the $10,560 million in bank notes - dollar bills - in circulation in the economy at that date. The foreign currency assets and liabilities illustrate a part of the Bank's role in official dealing between Canada and other countries.

But it is the bank's control functions and the way it carries these out which make the Bank of Canada a **central bank.**

It is the Bank of Canada's responsibility to:

1. control the Canadian money supply
2. control interest rates and credit conditions
3. maintain orderly conditions in financial markets
4. protect the external value of the Canadian dollar.

The Governor of the Bank of Canada, Mr. Gerald Bouey, operates the Bank of Canada, through a Board of Governors, to meet these responsibilities. This means that the assets and liabilities of the Bank of Canada must be administered with a view to meeting the control responsibilities rather than with a view to making a profit as would be the case in a commercial bank. The Bank of Canada's administration of its assets and liabilities to meet its responsibilities is called **monetary policy.** Monetary policy will be examined in Section 6. First the relationship between the Bank of Canada and the chartered banks must be explained.

# Commercial or chartered banking in Canada

The main features of the Canadian banking system are the eleven **chartered banks.** These are privately owned and operated, as described earlier, to make a profit. The table lists the major chartered banks in Canada, indicating the number of branches they operate and their size measured in terms of their asset holdings. Notice that the five largest banks taken together hold 90 percent of total bank assets and each of these top five has more than 900 branch offices.

The Major chartered banks in Canada

| Bank | No. of branches | Assets in $ millions |
|---|---|---|
| Royal Bank of Canada | 1522 | 51,722 |
| Canadian Imperial Bank of Commerce | 1716 | 45,995 |
| Bank of Montreal | 1255 | 38,180 |
| Bank of Nova Scotia | 994 | 34,869 |
| Toronto Dominion Bank | 1006 | 28,209 |
| National Bank of Canada | 757 | 15,475 |
| Mercantile Bank of Canada | 14 | 3,109 |
| Bank of British Columbia | 45 | 2,000 |
| Continental Bank ) | | |
| Northland Bank ) | 12 | 685 |
| Canadian Commercial & ) Industrial Bank | | |

These are the banks with which most Canadians do business. These banks hold deposits for their customers; they permit certain deposits to be transferred by cheque from one person's account to another person's account in any branch of any bank in the country; they make loans to people and to businesses; and they invest in government securities. In other words they offer banking services to the public.

In addition to these banks, the financial system has other financial institutions providing services to the public. Some of these other institutions like trust companies, credit unions, mortgage and loan companies and government savings offices accept deposits and make loans. Others, like finance companies make loans but do not accept deposits. Still others, like life insurance companies invest in government securities and mortgages. In other words, other institutions provide financial services and in many cases operate very much like banks. Banks are really only unique in their ability to **directly** transfer funds from one bank account to another. Other financial institutions use the banks for this purpose.

12 *Activity*

# The business of central banking

Arrange the following items in the Central Bank's balance sheet.

Central Bank

| Assets | Liabilities |
|---|---|
| | |

1. Loans to chartered banks $100
2. Deposits of Government of Canada $300
3. Central bank notes $1000
4. Government of Canada securities $5000
5. Deposits of chartered banks $3800

**a)** What % of its assets does the central bank hold as cash?

**b)** Which of the central bank's assets or liabilities might be included in the nation's money supply?

**c)** Does the central bank hold cash against the possibility its depositors might withdraw their deposits? Why or why not?

13 *Activity*

# Chartered banking in Canada

1. Do you hold a deposit in a Canadian chartered bank? Which bank?
2. If you hold a bank deposit, where does your bank rank in terms of size in the Canadian banking system?
3. Do you hold a deposit in a financial institution that is not a chartered bank? Which institution?
4. Why do you hold a deposit in a bank or other financial institution? Why in one particular bank or institution rather than another?
5. How do banks and other financial institutions compete for deposits? Why?
6. What % of total bank assets is held by the four largest Canadian chartered banks?
7. What percentage of total bank branches is operated by the four largest Canadian chartered banks?

C THE BANK OF CANADA AND THE CHARTERED BANKS

# The Bank of Canada and the chartered banks

The most important relationship between the Bank of Canada, the central bank, and the chartered banks is established by the **Bank Act.** This law, passed by the Government of Canada, defines the terms and conditions under which the chartered banks must operate. One key feature of the law is the legal requirement it places on the banks to hold reserves against their deposit liabilities in the form of Bank of Canada liabilities.

All banks are forced by law, the **Bank Act,** to hold cash reserves against their deposit liabilities. As the earlier discussion of bank operations illustrated, even in the absence of a legal requirement the banks would need to keep some cash to meet the day to day demands of their customers. The legal requirement goes beyond this need. Under the 1969 **Bank Act,** the banks were required to hold currency in their vaults or deposits with the Bank of Canada equal to 12 percent of their demand deposit liabilities and 4 percent of their notice and term deposit liabilities. Revisions to the **Bank Act** in 1980 made the reserve requirements 10 percent of demand deposits and 4 percent of notice deposits. Both the notes in their vaults and their Bank of Canada deposits which the banks must hold to meet their legal reserve requirements are liabilities of the Bank of Canada but reserve assets to the banks.

## C THE BANK OF CANADA AND THE CHARTERED BANKS

The following simple balance sheets illustrate the reserve requirements of the chartered banks and the relationship these requirements establish between the chartered banks and the Bank of Canada. The numbers used have been chosen to simplify the illustration. There are several major characteristics of this institutional system that deserve particular attention.

**Bank of Canada**

| Assets | | Liabilities | |
|---|---|---|---|
| Gov't of Canada Securities | $2,000 | Notes issued | $ 750 |
| | | Deposits of chartered banks | 1,000 |
| | | Other deposits | 250 |
| Total Assets | $2,000 | | $2,000 |

**All Chartered Banks**

| Assets | | Liabilities | |
|---|---|---|---|
| Required cash reserves | | Demand deposits | $ 4,000 |
| 1. Notes in the vaults | $ 200 | Term and notice deposits | $20,000 |
| 2. Bank of Canada deposits | $1,000 | | |
| Total | $1,200 | Total | $24,000 |
| Loans and Securities | $22,800 | | |
| Total Assets | $24,000 | Total Liabilities | $24,000 |

## C THE BANK OF CANADA AND THE CHARTERED BANKS

First, notice that the Bank of Canada noes not hold cash reserves against its deposit liabilities. The Bank of Canada is the source of cash and can issue additional new notes if and when these are required by the banks for their customer's use. The Bank of Canada's assets are Government of Canada securities. It buys, sells and holds whatever quantity of securities it thinks appropriate in terms of its control responsibilities. It pays for these by issuing new bank notes or deposits to the banks and the government. Thus, the Bank of Canada is the source of bank notes and deposits held by the chartered banks. In other words the Bank of Canada is the source of bank reserves.

Second, notice that the Chartered Banks, taken all together and individually, hold cash reserves as reguired by law. In this illustration the banks are holding 10% reserves against their $4000 of demand deposits for $400. In addition they are holding 4% cash reserves against their term and notice deposits of $20,000 for $800. This gives the banks a total required reserve position of $1200 against total deposits of $24,000 or a 5% reserve ratio. This 5% is a weighted average of the 10% and 4% required ratios where the weights are determined by the distribution of deposits.

Third, notice that the reserve assets held by the Chartered Banks are liabilities of the Bank of Canada. For example, the $1000 Bank of Canada deposit which appears as a reserve asset of the Chartered Banks is the same $1000 'Deposits of the Chartered Banks' liability which appears in the Bank of Canada balance sheet. Similarly, the $200 reserve asset of the banks hold as notes is a part of the $750 in notes issued as a liability by the Bank of Canada. The remaining $550 in notes ($750-200) issued by the Bank of Canada are being held by the general public as pocket money. Thus, the Bank of Canada is the source of the reserve assets the chartered banks are required by law to hold.

## C THE BANK OF CANADA AND THE CHARTERED BANKS

Combining these observations on the institutional arrangements illustrates the Bank of Canada's control over the money supply. First, the Bank of Canada controls the supply of bank reserves, namely its note and deposit liabilities. Second, the Chartered Banks are required by law to hold the Bank of Canada liabilities as reserves against their deposits at reserve ratios fixed by law. The banks cannot hold more customer deposits liabilities than they can cover with the reserves supplied by the Bank of Canada. Third, the public holds chartered bank deposits and Bank of Canada notes as money. Thus the total money supply available depends on the Bank of Canada's willingness to provide notes and reserve deposits or looking at the other side of the balance sheet, on the Bank of Canada's willingness to buy and hold Government of Canada securities.

Considering this simple illustration in terms of the earlier definitions of money supply the size of both M1 and M2 can be calculated.

M1 = notes outside the banks plus demand deposits

= \$550 + \$4,000 = \$4550

M2 = notes outside the banks plus demand plus term and notice deposits

= \$550 + \$4000 + \$20,000 = \$24,550.

These money aggregates reflect the Bank of Canada's willingness to provide cash and bank reserves and the public's willingness to both hold deposits in and borrow money from the chartered banks. In other words the money supply depends on the **behaviour** of:

1. the Bank of Canada in creating bank reserves
2. the chartered banks in accepting deposits and making loans
3. the general public in holding bank deposits and borrowing from the banks

The money supply is a result of the institutional structure and the behaviour of different agents within that structure.

14 *Activity*

# A banking system

Consider the following simplified banking systems:

**Central Bank**

| Assets | | Liabilities | |
|---|---|---|---|
| Securities | 10,000 | Notes | 3,000 |
| | | Deposits of banks | 7,000 |
| | 10,000 | | 10,000 |

**All chartered banks**

| Assets | | Liabilities | |
|---|---|---|---|
| Reserves | | Customer | |
| 1. Notes | 1,000 | deposits | 80,000 |
| 2. Deposits | 7,000 | | |
| | 8,000 | | |
| Loans & Securities | 72,000 | | |
| | 80,000 | | 80,000 |

1. Calculate the primary reserve ratio of the chartered banks.
2. If the legally required reserve ratio is 10% are the banks holding sufficient reserves?
3. What quantity of central bank notes are in circulation outside the banking system?
4. What quantity of central bank notes is held by the banks as reserves?
5. What percentage of their reserves do the banks hold in the central bank?
6. What percentage of central bank liabilities is chartered bank reserves?
7. What is the size of the money supply held by the public in this example?

# Summary

This section has examined the institutional arrangements that underly the Canadian money supply.

It has considered the Bank of Canada, Canada's **central bank** in terms of its objectives and methods of operation. The Bank of Canada's objectives are to control the behaviour of the banks and the size of the money supply. It operates to achieve these objectives mainly by controlling the cash reserves available to the banking system through control of its total assets.

This section has also considered the institutional aspects of chartered banking in Canada. It has described the type of banking which prevails, namely **branch banking** and identified the major banks in the system. The types of assets which banks hold and the relationship betweeen banks and their customers as illustrated by these assets has been considered. The willingness of customers to hold bank deposits and to borrow money from banks are essential to the classification of bank deposits as money and the ability of the banks to issue deposits.

Finally, the relationship between the Bank of Canada and the chartered banks has been illustrated. The Bank of Canada is the source of cash reserves or **primary reserves** for the banking system. The **Bank Act**, the law governing chartered bank operations, requires the banks to hold primary reserves equal to a fixed percentage of their deposit liabilities. This reserve requirement, combined with the Bank of Canada's unique role as supplier of primary reserves, gives the Bank of Canada control over the total deposit liabilities of the banks and thus control over the money supply.

# Money, The Banking System and the Supply of Money

This section draws together the main points of the preceding sections. In those sections, money has been defined, the money supply in Canada has been defined, banking operations have been illustrated, the banking system in Canada has been described and the underlying bahaviour of institutions and the general public has been examined. The interactions between and among institutions and the public determine what is money and what is the size of the money supply. These interactions now need to be summarized and emphasized.

a CENTRAL BANK LIABILITIES AS MONEY

# Central bank liabilities as money

The Bank of Canada, the central bank in Canada, is the institutional foundation of the Canadian financial system. It is the basic source of money. This central bank money takes two main forms, namely, bank notes issued by the central bank and central bank deposits of the chartered banks. Both are liabilities of the central bank but monetary assets to the public and reserve assets to the chartered banks. They provide the base for the money supply and are sometimes referred to as the **monetary base** or as **high powered money.** The size of the monetary base, or the supply of high powered money is controlled by the Bank of Canada.

Whether the Bank of Canada's liabilities take the form of bank notes or chartered bank reserve deposits depends on the behaviour of the public. The public has the choice of using either central bank notes or chartered bank deposits as money. If the public wants its money in the form of central bank notes rather than deposits, then deposits are withdrawn from the chartered banks, and the chartered banks in turn withdraw their deposits from the central bank in the form of central bank notes to give to their customers. Thus, if the public prefers to hold more bank notes and fewer bank deposits, the Bank of Canada will issue more bank notes and fewer reserve deposits to the chartered banks.

This relationship also works in the opposite direction. If the public decides to hold fewer central bank notes and more chartered bank deposits they will deposit notes in the banks. The banks in turn will deposit the notes in their accounts in the Bank of Canada and the Bank of Canada's note issue will decline while its deposit liabilities increase by equal amounts. Bank of Canada liabilities are money to both the public and the banks, but the type of liabilities the Bank of Canada issues depends on the public's preferences for notes and bank deposits.

# Chartered bank liabilities as money

Chartered bank deposit liabilities are the most important component of the Canadian money supply. Bank deposits provide the public with a medium of exchange and a store of value. But these same functions are also performed by bank notes issued by the central bank. This means the public has a choice between holding and using central bank notes as money or chartered bank deposits as money. The way the public chooses to hold and use money determines the amount of bank deposit money and the amount of bank note money in the economy at any one time.

The chartered banks encourage the public to hold and use chartered bank deposits as money, and the banks compete among themselves for the public's deposits. The banks offer the public a secure form in which to hold their money, namely bank deposits, and the convenience of making payment by writing cheques. The public may then regard bank deposits as a safe and convenient medium of exchange.

The banks also offer the public an alternative to central bank notes as a store of value, namely savings deposits. In the case of these deposits the banks offer to pay interest, as well as provide security, to encourage the public to exchange their central bank notes for savings deposits. Given these advantages the public may then regard savings deposits as a safe, convenient and profitable alternative to central bank notes as a store of value.

In either of these cases, the public would be exchanging liabilities of the central bank for liabilities of the chartered banks. Both these liabilities are money to the public. In other words either central bank notes or chartered bank deposits can serve as a medium of exchange and a store of value. The choice between them is based on the public's assessment of the relative advantages and disadvantages of the two liabilities as money.

15 *Activity*

# Central bank money: notes vs deposits

Consider the following two examples of possible relationships between a central bank and a banking system.

**Example I**
Central Bank

| Assets | | Liabilities | |
|---|---|---|---|
| Securities | 10,000 | Notes | 5,000 |
| | | Deposits of Banks | 5,000 |
| | 10,000 | | 10,000 |

**Example II**
Central Bank

| Assets | | Liabilities | |
|---|---|---|---|
| Securities | 10,000 | Notes | 100 |
| | | Deposits of Banks | 9,900 |
| | 10,000 | | 10,000 |

Chartered Banks

| Assets | | Liabilities | |
|---|---|---|---|
| RESERVES | | | |
| Notes | 1,000 | Cust. dep. | 60,000 |
| Deposits | 5,000 | | |
| | 6,000 | | |
| Loans & Securities | 54,000 | | |
| | 60,000 | | 60,000 |

Chartered Banks

| Assets | | Liabilities | |
|---|---|---|---|
| RESERVES | | Cust. dep. | 99,500 |
| Notes | 50 | | |
| Deposits | 9,900 | | |
| | 9,950 | | |
| Loans & Securities | 89,550 | | |
| | 99,500 | | 99,500 |

1. How much central bank money or **high powered money** has been created by the central bank in each example?
2. What percentage of **high powered money** is in the form of reserve deposits of the banking system in each example?
3. What percentage of **high powered money** is in the form of notes issued by the central bank in each example?
4. If notes issued by the central bank but **not** held by the banks are held by the public as pocket money, how much money is held by the public in the form of central bank notes in each example?
5. In which example does the public have a higher preference for bank notes relative to bank deposits as a form in which to hold money?

## b CHARTERED BANK LIABILITIES AS MONEY

The chartered banks compete with one another for the public's money. While the banking system as a whole wants the public to use bank deposits rather than notes as money, each individual chartered bank wants the public to use its deposits as money. This competition is reflected in the interest rates banks offer to pay, in the services they provide, in the hours they are open for business, in the location of branch offices, in the architecture and decore of bank premises and so forth. Customer deposits are the major source of bank funds and thus a bank's success in attracting customers is an important factor in its profitability.

But the most important thing to notice in this relationship between the public and the banks is the key role that public choice plays. If the public chose not to use or hold bank deposits as money, the banking system would be deprived of its major source of funds. For all practical purposes the banking system would cease to exist. The banking system's existence and survival is based on the public's willingness to use bank liabilities, namely bank deposits, as money.

On the other hand, if the public chose to hold only bank deposits as money, to use neither notes or coin, these other forms of money would disappear. This would result in a 'cashless' society, with all transactions financed by the transfer of bank deposits from one account to another. Technology to accomplish this already exists in the computerization of accounts and electronic transfer of funds. But the public still prefers to use each and the transfer of bank deposits by cheque rather than use 'debit cards' to automatically and immediately effect the transfer of bank deposits. As a result, the economy still uses both cash and bank deposits as money.

ć THE BANKING SYSTEM AND THE SUPPLY OF MONEY

# The Banking System and the Supply of Money

The public can choose to hold either central bank notes or chartered bank deposits as money. The available supply of central bank notes depends in part on the central bank's willingness to create central bank liabilities and in part on the public's willingness to hold central bank notes rather than chartered bank deposits. Similarly the available supply of chartered bank deposits depends in part on the willingness of the central bank to create central bank liabilities and in part on the willingness of the public to hold chartered bank deposits rather than central bank notes. The public cannot hold more notes than the total liabilities issued by the central bank nor can the public hold more deposits than the total liabilities of the central bank will secure according to the legally established reserve requirements. But between these two limits the size of the money supply provided by the banking system will depend on the total liabilities or **monetary base** provided by the central bank and the public's choice of the forms in which money will be used and held.

These basic relationships determine the size of the nations' money supply. The central bank can increase or decrease the size of the money supply by increasing or decreasing the number of assets it holds and the liabilities it has created to pay for those assets. In other words the central bank can change the monetary base at its discretion and through such a change, change the availability of central bank notes or chartered bank reserves.

16 *Activity*

# The supply of chartered bank deposit liabilities

For any given monetary base provided by the central bank, the supply of chartered bank deposit liabilities depends on the willingness of the public to use and hold bank deposits as money. The alternative the public has is to hold central bank notes rather than chartered bank deposits as money. The example used in Activity 15 illustrates this point as well as illustrating the effects of the public's desire to hold central bank notes.

Referring to the simple balance sheets of Activity 15, review the answers to the questions in Activity 15 and consider the following additional questions.

1. How much money is held by the public in the form of bank deposits in each example?
2. In which example does the public hold a higher ratio of bank deposits to central bank notes?
3. In which example is the banking system larger measured in terms of total assets?
4. If public preferences changed in a way that led them to hold more central bank notes and fewer chartered bank deposits what would happen to the size of the banking system? Explain.
5. If the public decided to hold only bank deposits as money and no bank notes what would be the size of the reserve asset holdings of the chartered banks in examples I and II?

## C THE BANKING SYSTEM AND THE SUPPLY OF MONEY

The public determines the form and use of the monetary base created by the central bank. The monetary base can be held by the public as notes or, if the public chooses bank deposits, the monetary base can be held by the chartered banks as reserves against their deposit liabilities. If the public changes its preference for bank deposits relative to notes as a form of money, the chartered banks in the system experience changes in their reserves and thus in the total of deposit liabilities they can issue. The desire to earn profits encourages the chartered banks to buy as many earning assets, or make as many loans and thereby issue as many deposits as their holdings of reserves permit. Thus public preference, the profit motive of banks and the legal reserve requirement operate together to determine the total of bank deposits issued relative to a given monetary base.

The total money supply in the economy at any point in time is defined as central bank notes in the hands of the public plus chartered bank deposits. In an institutional structure such as that in Canada with a central bank, a number of chartered banks and a legal reserve requirement the central bank has control over the money supply. The public's preferences for bank notes versus bank deposits tends to be very stable over time. Thus by changing the size of the monetary base the central bank can control the money supply in the economy. This deliberate control of the money supply is called '**monetary policy**' and is discussed in the next section.

17 *Activity*

# Measuring the Money Supply

Consider the following structure of banking system.

| Central Bank | | Chartered Banks Consolidated | |
|---|---|---|---|
| Assets | Liabilities | Assets | Liabilities |
| | | | |

1. Enter the following assets and liabilities in the appropriate place or places in the balance sheets.
   a. Central bank holdings of government of Canada securities $6000
   b. Chartered bank reserve deposits $4500
   c. Central bank notes outstanding $1500
   d. Chartered bank customer deposits $50,000
   e. Notes in vaults of chartered banks $500
   f. Chartered bank loans to customers $45,000
2. Of the $1500 in notes issued by the central bank how much is held by the banks? How much by the public?
3. If the money is made up of notes in the hands of the public plus chartered bank deposits, what is the size of the money supply in this example?

# Summary

This section has drawn together discussions for the earlier sections to concentrate on the relationships between and among institutional structure, public behaviour, bank behaviour, legal requirements and the money supply.

The institutional structure is made up of a central bank and a number of independent chartered banks. The central bank creates and controls the size of the monetary base which in turn can be used either as bank note money by the public or primary reserves by the chartered banks. This provides for two components of the money supply, namely, central bank notes and chartered bank deposits.

The behaviour of the public and the behaviour of the banks determine the size of the money supply relative to the monetary base. By holding bank deposits as money the public allows the chartered banks to hold the monetary base as primary reserves against their deposit liabilities. By seeking to earn maximum profits, the banks expand their loans and their deposit liabilities up to the limit established by the legal reserve requirements and the monetary base.

Finally, since the public's preference for bank deposit money, the bank's desire to earn profits and the legal reserve requirement are quite stable, the central bank can control the money supply by controlling the monetary base it creates.

# Monetary policy

Monetary policy is defined as action by the central bank, the Bank of Canada, designed to influence the level of national income, employment and the price level. The Bank of Canada attempts to influence the economy by altering the money supply and the costs of borrowing money, namely interest rates. Its objective is to help the economy perform at acceptable levels of unemployment and inflation or price stability.

a CENTRAL BANK CONTROL OF THE MONEY SUPPLY

# Central bank control of the money supply

In conducting monetary policy, the Bank of Canada operates within the institutional structure and behavioural relationships described in previous sections. The banking system is subject to Bank of Canada control because the banks are required by law to hold Bank of Canada liabilities as reserves against their customers' deposits. Public willingness to hold and use bank deposits as money provides the banks with a source of funds and the reserve assets they require. The banks' desire to earn profits combined with the public's willingness to borrow from the banks induces the banks to hold earning assets (loans) and issue deposits up to the limit established by the availability of bank reserves and the legal reserve requirement. Changes in the supply of Bank of Canada liabilities used by the banks as reserves, produce predictable changes in the supply of bank deposit money and the amount of bank lending.

A numerical example of the relationship between the supply of Bank of Canada liabilities, the supply of bank deposit money and the amount of bank lending is provided by Activity 18. It illustrates how changes in central bank liabilities result in changes in bank lending, bank deposits and the money supply. Because the Bank of Canada can change the outstanding total of its liabilities, by buying or selling the government securities it holds as assets, it can control the size of the money supply and the supply of bank lending. This control is the basis of monetary policy.

18 *Activity*

# Changing the money supply

Consider two examples:

**EXAMPLE I**

| Bank of Canada | | | | All Chartered Banks | | | |
|---|---|---|---|---|---|---|---|
| **Assets** | | **Liabilities** | | **Assets** | | **Liabilities** | |
| Govt. Sec. | 11,000 | Notes | 1,000 | Res. notes | 500 | Cust. Dep. | 210,000 |
| | | Dep. of | | Res. dep. | 10,000 | | |
| | | Banks | 10,000 | | 10,500 | | |
| | 11,000 | | 11,000 | Loans | 199,500 | | |
| | | | | | 210,000 | | 210,000 |

1. How much are the total liabilities of the Bank of Canada?
2. How much do the banks hold as primary reserves?
3. How much lending have the banks done?
4. How much money does the public hold in bank deposits? In notes?
5. What is the primary reserve ratio in the chartered banks?
6. What is the size of the money supply?

**EXAMPLE II**

| Bank of Canada | | | | All Chartered Banks | | | |
|---|---|---|---|---|---|---|---|
| **Assets** | | **Liabilities** | | **Assets** | | **Liabilities** | |
| Govt. Sec. | 12,000 | Notes | 1,000 | Res. notes | 500 | Cust. dep. | 230,000 |
| | | Dep. of | | Res. dep. | 11,000 | | |
| | | Banks | 11,000 | | 11,500 | | |
| | 12,000 | | 12,000 | Loans | 218,500 | | |
| | | | | | 230,000 | | 230,000 |

7. How much are the total liabilities of the Bank of Canada?
8. How much do the banks hold as primary reserves?
9. How much lending have the banks done?
10. How much money does the public hold in bank deposits? In notes?
11. What is the primary reserve ratio in the chartered banks?
12. What is the size of the money supply?

b MONETARY POLICY TARGETS, GNP AND PRICES

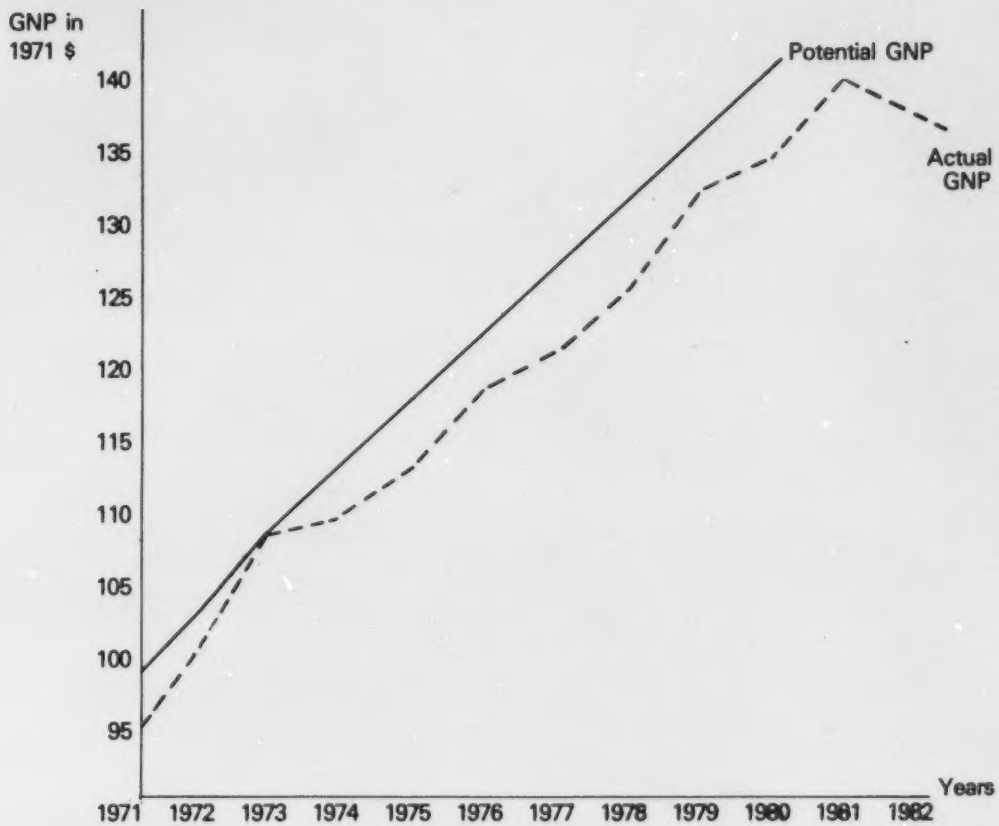
# Monetary policy targets, GNP, and prices

The objective of monetary policy is to influence the level of national income or GNP and the level of prices of the rate of inflation. Policy is directed toward **target** levels of GNP and inflation. For GNP the target is defined as Potential GNP which is the level of output the economy would produce if its productive resources were fully employed in a normal way. Because the labour force in the economy and the productivity of labour both tend to increase over time, **potential GNP** is a moving target which in Canada grows at a rate of approximately 4.5% per year. This is illustrated in chart No. 1. The straight solid line plots values of **potential GNP** for Canada for each year 1971-1982. The dotted line plots values of actual real GNP in the same years. One objective of monetary policy could be to reduce or eliminate the vertical gap between potential and actual GNP by influencing the level of actual GNP. Eliminating the gap would move the economy to normal levels of output and employment.

A second major target of monetary policy could be price 'stability' or the control of inflation. An 'appropriate' or acceptable rate of inflation is difficult to define. Past government policy in Canada, such as the Anti Inflation Program of 1975-1978, appeared to set an annual rate of change of prices in the 2%-4% range as acceptable. Current government programs seem to view a 5% annual rate of inflation as a reasonable goal. The chart No. 2 illustrates Canada's actual inflation performance and its relationship to these policy targets of inflation in the 2%-5% range. The objective of monetary policy, in terms of this target, should be to reduce the actual rate of inflation to the target rate.

b MONETARY POLICY TARGETS, GNP AND PRICES

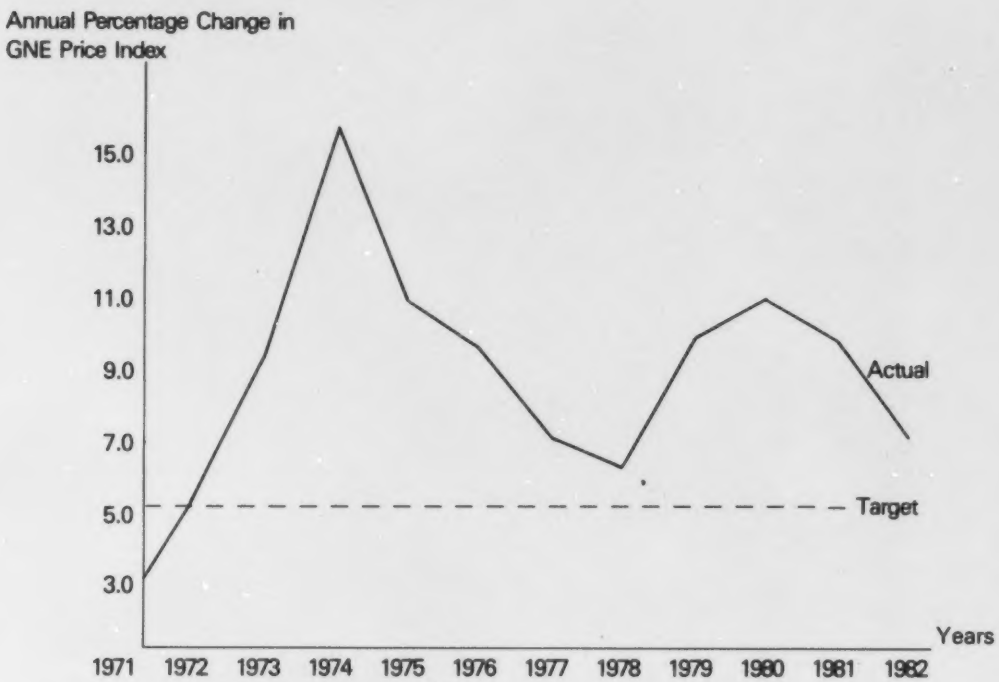
# Chart No. 1




Calculated from Data in
**Bank of Canada Review**
(Nov. 82)

b MONETARY POLICY TARGETS, GNP AND PRICES

# Chart No. 2




**Bank of Canada Review**
(Nov. 82)

19 *Activity*

# Potential GNP, actual GNP and unemployment

Potential GNP is the level of output the economy would produce if all productive resources were fully employed in a normal way.

Suppose the Canadian labour force grows at a rate of 3% per annum and that labour productivity, measured in terms of output per worker, grows at 1 1/2% per year. A crude estimate of the **potential rate of growth** in the economy is then 4 1/2% (= 3% + 1 1/2%). If the real output of the economy were to grow at 4 1/2% in the circumstances set out here, the unemployment rate would be constant. Employment would expand at exactly the rate necessary to absorb the growth in the labour force.

If the unemployment rate of approximately 6.5% in 1972 represented a 'normal' level of employment for the economy and resulted in a level of real GNP of $100.2 billion, **potential output** in 1972 would be equal to actual output. To complete the following table calculate **potential output** for each year assuming 6.5% unemployment and 4 1/2% real growth. Then calculate the **GNP gap**, the difference between actual GNP and potential GNP expressed as a % of potential GNP.

| Year | Actual Real GNP (1971 $ millions) | Potential GNP (1971 $ millions) | Difference (2) - (3) (1971 $ millions) | GNP GAP (4) - (3) x 100% (%) | Unemployment Rate (%) |
|---|---|---|---|---|---|
| 1972 | 100,248 | 100,248 | 0 | 0 | 6.2% |
| 1973 | 107,812 | 104,759 | 3053 | + 2.9 | 5.5% |
| 1974 | 111,678 | | | | 5.3% |
| 1975 | 113,005 | | | | 6.9% |
| 1976 | 119,249 | | | | 7.1% |
| 1977 | 121,762 | | | | 8.1% |

Source: **Bank of Canada Review** (February, 1983)

1. Between 1972 and 1973 actual GNP grew faster than POTENTIAL GNP. As a result the GNP GAP became (positive/negative/zero) and the unemployment rate (increased/decreased/remained unchanged).
2. Between 1974 and 1975 actual output grew (faster than/more slowly than) POTENTIAL GNP. As a result the GNP GAP became (positive/negative/zero) and the unemployment rate (increased/decreased/remained unchanged).
3. In general, between 1972 and 1977 when actual GNP grew at a faster annual rate than POTENTIAL GNP the unemployment rate (increased/decreased) and when actual GNP grew at a slower annual rate than POTENTIAL GNP the unemployment rate (increased/decreased).
4. On the basis of recent changes in the unemployment rate, how has the economy actually performed measured against its potential.

19 *Activity*

# Potential GNP, actual GNP and unemployment

It is clear from the illustration of Charts I and II that monetary policy targets have not been met in Canada in the past ten years. There are many reasons for this apparent lack of success, including the operation of other economic policies in Canada and the course of economic events on an international scale. Monetary policy is only one of the policy instruments available to the federal government and it cannot be expected to solve all economic difficulties. Indeed it is probably most appropriate to think of monetary policy as policy of 'leaning against the wind' or in other words, of resisting the economy's movements away from targets rather than forcing the economy toward targets.

C MONETARY POLICY INDICATORS

# Monetary policy indicators

The thrust or influence of monetary policy on economic activity is judged on the basis of **indicators** of monetary policy. There are two main indicators. First, there is the rate of growth of the money supply measured by some money aggregate. Second, there is the cost of credit or the cost of borrowing measured by the interest rate. Changes in these indicators signal changes in the influence of monetary policy.

Consider first, the rate of growth of a money aggregate as an indicator of monetary policy. The previous discussion of measuring the money supply has offered several different money aggregates for consideration. Chart III plots the annual percentage change in the money aggregate M1. This is the money aggregate the Bank of Canada has argued is most closely related to economic activity.

## C MONETARY POLICY INDICATORS

# Chart 3

(Source: — **Bank of Canada Review** Nov. 82)

## C MONETARY POLICY INDICATORS

The choice of the rate of growth of a money aggregate as an indicator of monetary policy is based on an expected relationship between money supply and economic activity, and prices. The rate of growth of expenditure in the economy is expected to be closely related to and determined by the rate of growth of the money supply. To take an example, if the money supply increases by 10 percent from one year to the next the level of expenditures will increase by 10 percent from one year to the next. Thus higher rates of growth in the money supply are expected to produce higher rates of growth in expenditure in subsequent years. As a result, if this relationship holds, increases in the rate of growth of the money supply indicate movements to more expansionary monetary policy while reductions indicate contractionary monetary policy.

The rates of growth of the money supply illustrated in Chart III can be used in this way to indicate the nature of recent Canadian monetary policy. In the period 1971-73 rates of growth of the money aggregate M1 were high and increasing indicating expansionary monetary policy. From 1973-1978 rates of growth of M1 fluctuated quite widely suggesting swings in monetary policy from contractionary in 1974 to expansionary in 1975 to contractionary in 1976 followed by some moderation in 1977 and 1978. In the last part of the period rates of growth of M1 declined consistently, 1979-1982, indicating an increasingly restrictive monetary policy. This is consistent with the earlier observation from Chart I that the economy increasingly diverged from the potential output target. It correctly suggests the major focus of monetary policy was the inflationary situation illustrated in Chart II.

The cost of credit or the cost of borrowing provides a second indicator of monetary policy. Underlying this indicator is the idea that the level of expenditure in the economy is affected by the cost of borrowing. In other words, the quantity of goods and services people are willing and able to buy on credit, or buy using borrowed money depends on the cost of borrowing money. The effects of interest costs in financing the purchases of new cars or new houses are obvious examples. People presumably will buy fewer cars or fewer houses or less expensive cars or houses if they have to pay more to finance the purchase. Thus, as a first approximation, higher interest rates indicate monetary policies that restrict expenditures and lower interest rates indicate expansionary policies.

## C MONETARY POLICY INDICATORS

However, just looking at market rates of interest as indicators of monetary policy can be misleading. The true cost of borrowing depends on both the market rate of interest and the rate of inflation of prices and incomes. Inflation reduces the value or purchasing power of money repaid at the end of a loan. Similarly, the burden of interest payments to the borrower is reduced if the borrower's money income is rising. Recognizing both these aspects of inflation, economists, and many borrowers and leaders as well, usually adjust market rates of interest for inflation. Looking back in time to past experience, this is a simple matter of subtracting the rate of inflation from the market rate of interest to get a **real rate of interest.** Since borrowing decisions are made for the future, we need to estimate inflation for the period during which funds are borrowed. The real rate of interest approximates the cost to the borrower and the returns to the lender of loan contracts. To take an example, a market rate of interest of 12% in a time of 10% inflation in prices and incomes suggests a real cost of borrowing and a real return to lending of 2% = 12% - 10%. Looking ahead, the problem is more complex because potential borrowers and lenders must assess current interest rates in terms of expected or future rates of inflation to estimate real interest rates.

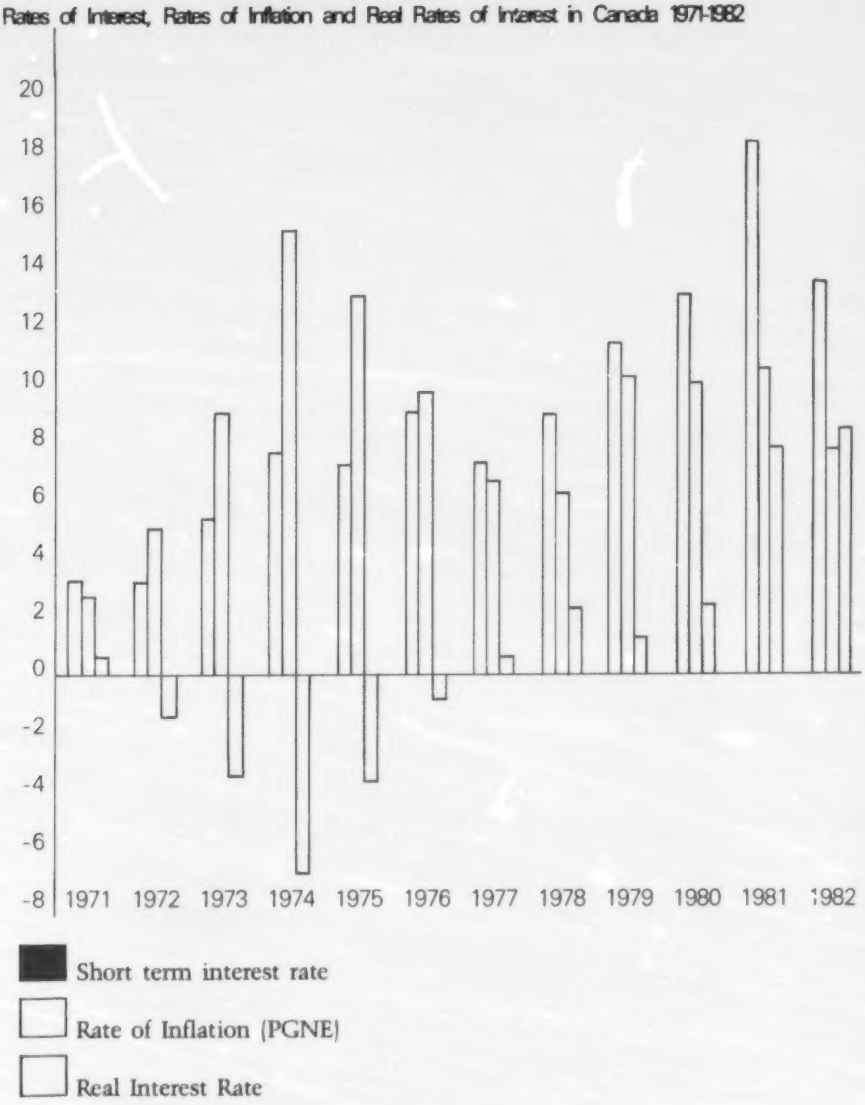
Chart IV illustrates the levels of short term interest rates, rates of inflation and real short term interest rates in the Canadian economy from 1971 to 1982. Using observed market short term interest rates as indicators of monetary policy, suggests that monetary policy tended to become more restrictive from 1971 to 1976 because actual interest rates increased. However, this was a period of sharply increasing and persistent rates of inflation. Adjusting for the effects of this inflation and using real rates of interest, an expansionary monetary policy is indicated. Real rates of interest were negative from 1972 to 1976. In the same way, real rates of interest indicate that monetary policy was neither strongly expansionary or strongly restrictive from 1977 to 1980. In 1981 and 1982, however, high positive real rates of interest indicate a strongly contractionary monetary policy. Over the entire period, real rates of interest indicate that monetary policy shifted dramatically from being an expansionary force to being a contractionary force in the economy.

C

## MARKET RATES OF INTEREST, RATES OF INFLATION AND REAL RATES OF INTEREST IN CANADA 1971-1982

# Chart No. 4

Market Rates of Interest, Rates of Inflation and Real Rates of Interest in Canada 1971-1982




Calculated from Data in the **Bank of Canada Review** (Nov. 1982)

20 *Activity*

# Nominal interest rates, rates of inflation and real interest rates

The table presents average annual values for short term interest rates and for the **consumer price index** in Canada from 1975-1982. Short term interest rates measures the money cost of borrowing. The **consumer price index** measures the current money cost of buying a standard bundle of goods and services relative to the money cost of the same bundle of goods and services in 1971. The annual percentage change in the **consumer price index** is one way to measure inflation.

| Year | Short Term Interest Rate | Consumer Price Index (1971 = 100) | Rate of Inflation | Real Rate of Interest |
|---|---|---|---|---|
| 1975 | 7.4 | 138.5 | – | – |
| 1976 | 8.9 | 148.9 | | |
| 1977 | 7.4 | 160.8 | | |
| 1978 | 8.6 | 175.2 | | |
| 1979 | 11.6 | 191.2 | | |
| 1980 | 12.8 | 210.6 | | |
| 1981 | 17.8 | 236.9 | | |
| 1982 | 13.8 | 262.5 | | |

Source: **Bank of Canada Review** (February, 1983).

1. Calculate the annual rates of inflation from 1975 to 1982 measured by the annual percentage change in the Consumer Price Index.
2. Calculate the **real rate of interest** from 1975 to 1982 by subtracting the annual rate of inflation from the average annual value of the short term interest rate as presented in the table.
3. If the real rate of interest indicates the effect of monetary policy on the economy, monetary policy from 1975 to 1977 tend to become (expansionary/contractionary) or at least (more/less) restrictive.
4. If the real rate of interest indicates the effect of monetary policy on the economy, monetary policy from 1977 to 1981 tended to become progressively (more/less) restrictive and then in 1982 became (more/less) restrictive.
5. In terms of real rates of interest, how would you describe the influence of monetary policy since 1982?

d INSTRUMENTS OF MONETARY POLICY

# Instruments of monetary policy

In administering or conducting monetary policy, the Bank of Canada employs what are called instruments of monetary policy. These instruments are specific aspects of Bank of Canada operations designed to produce the effects on money supply and credit conditions the Bank thinks are appropriate in terms of the targets of monetary policy discussed above. The two most important instruments of monetary policy are **open market operations** and **bank rate adjustments.** The Bank has other potential instruments of policy but it has tended to rely most heavily on these two.

Open market operations are used by the Bank of Canada on a day to day basis to adjust its total asset holdings and thereby adjust its total outstanding liabilities. Bank of Canada liabilities, mainly bank notes and deposits of the chartered banks provide the monetary base and the reserves required by the banking system. Because the banks are required by law to hold Bank of Canada liabilities as reserves against their deposit liabilities, changes in Bank of Canada liabilities cause changes in the amount of bank deposit money in the economy and changes in the money supply. Open market operations are a policy instrument used to control the size and rate of growth of the money supply by controlling the monetary base.

Open market operations are defined as the purchase or sale of Government of Canada securities (bonds) in the open bond market. This market is open in the sense that any individual or business wishing to buy or sell government securities places offers to buy or sell through a broker or bank to this market. The Bank of Canada is just one of a very large number of buyers or sellers in the market. As a result, the Bank of Canada operates anonymously in the market as any other participant would.

## d INSTRUMENTS OF MONETARY POLICY

If the Bank of Canada feels the money supply should grow it buys government securities on the open market. The Bank of Canada holds these securities as assets and pays for them by issuing its own liabilities, namely, bank notes or Bank of Canada deposits. This creates an increase in the monetary base and the reserves available to the banking system allowing an expansion of bank lending and bank deposits.

On the other hand, if the Bank of Canada feels the money supply should contract it sells government securities on the open market. This reduces the Bank of Canada's asset holdings and destroys an equal quantity of Bank of Canada liabilities and bank reserves. The chartered banks are then forced to reduce their lending and deposit holdings to maintain their legally required reserve position.

Open market operations are the most powerful and most important monetary policy instrument available to the Bank of Canada. They are used continuously to control money supply growth in terms of the Bank's policy targets defined in terms of national income and price stability. In recent years, until late 1982, the Bank has used rates of growth of M1 as its policy indicator and conducted its open market operations to achieve rates of growth of M1 within stated target ranges. Open market operations can also be used to establish and maintain particular interest rate levels but this implies neglecting rates of growth of money supply in favour of controlling interest rates.

The **Bank Rate** is the second major policy instrument used by the Bank of Canada. The Bank Rate is the rate of interest the Bank of Canada would charge the chartered banks if they had to borrow from the Bank of Canada to meet their legal reserve requirements. It establishes a base for the interest rate structure in the economy with other interest rates set according to some differential relative to the Bank Rate. For example, the **prime rate** set by the chartered banks, the rate of interest they would charge their largest and strongest business borrowers, is usually a percentage point or more above the Bank Rate. Rate in mortgage loans and consumer loans are usually higher again than the prime rate reflecting different costs and risks on these types of lending. Other rates of interest tend to fall within this pattern with some slightly below the Bank Rate, for example, the rate on government treasury bills and others above the Bank Rate on the basis of some 'normal' differential.

## d INSTRUMENTS OF MONETARY POLICY

With this sort of interest rate structure related to the Bank Rate, the Bank of Canada can use the Bank Rate to indicate and subsequently achieve what it feels is the 'appropriate' level of interest rates in the economy. An increase in the Bank Rate indicates that the Bank of Canada wants interest rates to rise and will be operating to achieve that result. The banks and other lenders usually respond quite quickly to this signal. Alternatively, if the Bank of Canada wants an easing of credit conditions and a fall in interest rates it can signal this by reducing the Bank Rate. The banks and other lenders respond by reducing their rates.

The Bank of Canada's objective in influencing interest rates is to influence the level of expenditure, income and employment in the economy. By reducing interest rates, the Bank hopes to stimulate an increase in borrowing to finance expenditure and add to the demand for output and employment. Raising interest rates is intended to have the opposite effect. The **Bank Rate** is a policy instrument that depends for its effectiveness on the reaction of the economy to changes in the cost of borrowing. The Bank Rate is currently set at a weekly auction of Treasury Bills at which Bank of Canada is an important buyer.

Open market operations and Bank rate are the two main policy instruments used by the Bank of Canada. Other policy instruments are available and are used, but they are essentially supplementary to rather than alternative to these main instruments.

# Summary

This section has considered monetary policy in Canada. Monetary policy was defined as deliberate management of the money supply and interest rates by the Bank of Canada to influence the performance of the economy. The aims or **targets** of monetary policy were defined and specified and illustrated in terms of **potential output** and 'acceptable' rates of inflation. The expansionary or contractionary influence of monetary policy was judged in terms of the rate of growth of the money supply or the real rate of interest, two alternative **indicators** of **monetary policy.** The administration or implementation of monetary policy was considered on the basis of the two major **instruments of monetary policy** namely open market operations and the Bank Rate. Taken together, these concepts, targets, indicators and instruments provide a basic description and illustration of how the Bank of Canada attempts to meet its responsibilities to influence economic activity.

# Answers to Activity Questions

**ACTIVITY 1**

**The following things would be accepted by just about anybody as payment:**

**3.** Bank of Canada dollar bills
**4.** Canadian twenty-five cent pieces
**5.** Deposits in the Bank of Montreal

They are generally acceptable because the rate at which they can in turn be exchanged for goods or services is well established and understood.

Other items listed namely:

**1.** sea shells
**2.** United States dollar bills
**6.** shares of Bell Canada stock
**7.** a quantity of gold or silver
**8.** a quantity of diamonds
**9.** a cow or cows
**10.** a beaver pelt or pelts

are not generally acceptable as payment in part because their value in exchange is not generally and immediately known, and in part because anyone accepting one of these items in payment cannot be sure others will accept it in turn. To illustrate these points one might ask "What is the price of one basic 10 speed bicycle in terms of (gold, or Bell Canada stock, etc)?" and note the different responses the question produces.

**ACTIVITY 2**

The following table relates items and monetary characteristics.

| Characteristic / Item | limited supply | consistent quality | divisible | desirable or useful | high value/ bulk |
|---|---|---|---|---|---|
| 1. Sea Shells | | X | | X | |
| 2. cloth | | X | X | X | |
| 3. tobacco | | | X | X | X |
| 4. glass beads | | X | | X | |
| 5. cows | | | | X | |
| 6. camels | | | | X | |
| 7. gold dust | X | | X | X | X |
| 8. gold coin | X | | X | X | X |
| 9. cigarettes | | X | X | X | X |
| 10. bank deposits | X | X | X | | X |
| 11. bank deposits | X | X | X | | X |

Certain items like cows and camels have obvious disadvantages such as lack of divisibility and low portability. Others may not be sufficiently restricted in supply to stabilize their exchange value.

Currency and bank deposits have all the desirable characteristics except being desirable or useful in their own right. But as long as something is acceptable it may be an advantage that it is not desired for its own characteristics since this prevents its disappearance through consumption.

# Answers to Activity Questions

## ACTIVITY 3

| | 1 movie ticket | 1 pair jeans | 1 shirt | 1 tennis racquet | 1 hamburger |
|---|---|---|---|---|---|
| 1 movie ticket | 1 | 1/5 | 1/4 | 3/20 | 5 |
| 1 pair jeans | 5 | 1 | 1 1/4 | 3/4 | 25 |
| 1 shirt | 4 | 4/5 | 1 | 3/5 | 20 |
| 1 tennis racquet | 6 2/3 | 4/3 | 5/3 | 1 | 100/3 |
| 1 hamburger | 1/5 | 1/25 | 1/20 | 3/100 | 1 |

1. Yes, a shirt is worth $20 and a movie ticket $5.
2. Yes, a tennis racquet is worth $33.33 and a pair of jeans $25.

## ACTIVITY 4

1. All of these things could be used to store purchasing power.
2. Bank deposits, government bonds and Bell Canada shares would pay money income.
3. Gold bars, oil paintings, government bonds and Bell Canada shares might increase in market price.
4. Gold bars, oil paintings, government bonds and Bell Canada shares might decrease in market price.
5. Bank notes, coins and bank deposits could be 'sold' immediately for a guaranteed price not less than what you paid for it.
6. Bank notes, coins and bank deposits are money.

## ACTIVITY 5

a) 1. 62% (M1 - currency) ÷ M1
2. 11.5% (currency ÷ M2)
3. 92% (M3 – currency) ÷ M3
4. 11.5% (M1B – M1) ÷ M2

b) The bank deposit part is larger.

## ACTIVITY 6

a) 1. ratios $M1B/M1$ 1978:1.38, 1980:1.32, 1982:1.29
2. ratios $M2/M1$ 1978:3.31, 1980:3.84, 1982:4.75
3. ratios $M3/M1$ 1978:4.72, 1980:5.73, 1982:6.78

b) The ratios change with $M1B/M1$ declining but $M2/M1$ and $M3/M1$ rising. The increase in interest rates paid on deposits included in M2 and M3, relative to the rates paid on M1B and M1, provide one important explanation of these changes.

# Answers to Activity Questions

## ACTIVITY 7

**a)** 1. % change in M1 78-79:7.8%, 79-80:7.2%, 80-81:5.9%, 81-82:2.8%
2. % change in M1B 78-79:5.3%, 79-80:4.7%, 80-81:5.8%, 81-82:6.4%
3. % change in M2 78-79:12.9%, 79-80:18.9%, 80-81:13.3%, 81-82:18.7%

**b)** Rates of growth of money supply have been variable. For example, the annual rate of growth of M2 has fluctuated between 12.9% and 18.9% over the four annual periods considered.

**c)** Different money aggregates have had very different annual growth rates. For example M1 grew by 2.8% from 1981-82 while M2 grew by 18.7% in the same year.

## ACTIVITY 8

**a)** 1. Ratio of GNP/M1 1978:10.7 1980:11.8 1982:13.3
2. The ratio of GNP/M2 1978:3.2 1980:3.1 1982:2.8

**b)** Ratio of GNP/M1 has increased but ratio of GNP/M2 has decreased.

**c)** Yes.

## ACTIVITY 9

**1.** Net cost to funds is $500. **2.** 12.5% **3.** 15%

## ACTIVITY 10

**1.**

ABC BANK

| | | | |
|---|---|---|---|
| 1. Cash | 500 | 2. Saving deposits | 3500 |
| 3. Business loans | 1500 | 5. Demand deposits | 1000 |
| 4. Gov't. Sec. | 500 | 7. Notice deposits | 500 |
| 6. Consumer loans | 2500 | | |
| | 5000 | | 5000 |

**2.** Total deposits 5000
Primary reserves 500
Loans and securities 4500

**3.** Primary reserve ratio 10%

## ACTIVITY 11

**1.** 5% **2.** 10% **3.** 15% **4.** 90%

## ACTIVITY 12

Central Bank

| Assets | | Liabilities | |
|---|---|---|---|
| 4. Gov't. of Can. Sec. | $5000 | 3. Central bank notes | $1000 |
| 1. Loans to banks | 100 | 5. Deposits of banks | 3800 |
| | | 2. Deposits of Gov't. | 300 |
| | $5100 | | $5100 |

1. The central bank holds **no** cash assets.
2. Central bank notes might be included in the money supply.
3. The central bank does not hold cash against possible withdrawals by its depositors. If the banks or the government want cash for their deposits the central bank issues new cash, or in other words creates new cash.

# Answers to Activity Questions

**ACTIVITY 13**

5. Banks and other institutions compete for deposits on the basis of both price and service. Price competition involves the rate of interest on the rate of service charge or a combination of the two attached to deposits. The 'service' that financial institutions offer covers most aspects of their business from hours of operation, types of deposits, financial advice, location of branches, office design and decor and so forth. This competition is important because banks and other similar institutions derive most of their funds from depositors.
6. Total assets from table on p. 40 $218.244 million
   Assets of four largest banks 170,766
   Assets of four largest banks amount to 78.2% of total assets.
7. Total branches from table on p. 40 7321
   Branches of four largest banks 5487
   Branches of four largest banks account for 74.9 of total branches.

**ACTIVITY 14**

1. primary reserve ratio is 10%
2. yes
3. $2000 = 3000 notes issued = 1000 notes held by banks
4. $1000
5. 87.5%
6. 80%
7. $82,000 = 80,000 deposits + 2000 notes

**ACTIVITY 15**

1. In each example 'high powered money' is $10,000.
2. 60% of high powered money is held as bank reserves in Example I. 99.5% of high powered money is held as bank reserves in Example II.
3. Notes issued by the central bank account for 50% of high powered money in Example I and 1% in Example II.
4. The public holds $4000 in notes as pocket money in Example I and $50 in Example II.
5. The public has a higher preference for bank notes relative to bank deposits in Example I.

**ACTIVITY 16**

1. Public holds $60,000 in bank deposits in Example I and $99,500 in Example II.
2. Example II.
3. Example II.
4. The banking system would contract. A smaller part of the high powered money issued by the central bank would be available to the banks as reserves. With smaller reserves the banks have to hold fewer deposits.
5. If the public decided to hold only bank deposits, reserve assets in the banks in Examples I and II would be $10,000.

# Answers to Activity Questions

## ACTIVITY 17

**1.**

| Central Bank | | | | Chartered Banks | | | |
|---|---|---|---|---|---|---|---|
| a) | 6000 | b) | 4500 | e) | 5,000 | d) | 50,000 |
| | | c) | 1500 | f) | 45,000 | | |
| | 6000 | | 6000 | | 50,000 | | 50,000 |

**2.** Banks hold $500 in notes, the public holds $1000.

**3.** In this example, money supply is $50,000 deposits plus $1000 notes for a total of $51,000.

## ACTIVITY 18

| EXAMPLE I | | EXAMPLE II | |
|---|---|---|---|
| 1. $ 11,000 | 4. $210,000,500 | 7. 12,000 | 10. $230,000, 500 |
| 2. 10,500 | 5. 5% | 8. 11,500 | 11. 5% |
| 3. 199,500 | 6. $210,500 | 9. 218,500 | 12. $230,500 |

## ACTIVITY 19

| Year | Actual Real GNP | Potential GNP (1971 $ millions) | Difference (1981 $ millions) | GNP GAP % |
|---|---|---|---|---|
| 1974 | | 109,473 | 2205 | + 2.0 |
| 1975 | | 114,400 | -1395 | -1.2 |
| 1976 | | 119,548 | -299 | -0.3 |
| 1977 | | 124,927 | -3165 | -2.5 |

**1.** positive, decreased

**2.** more slowly, negative, increased

**3.** decreased, increased

## ACTIVITY 20

**1. 2.**

| Year | Rate of Inflation | Real Rate of Interest |
|---|---|---|
| 1976 | 7.5 | 1.4 |
| 1977 | 8.0 | -0.6 |
| 1978 | 9.0 | -0.4 |
| 1979 | 9.1 | 2.5 |
| 1980 | 9.9 | 2.9 |
| 1981 | 12.5 | 5.3 |
| 1982 | 10.8 | 3.0 |

**3.** expansionary, less

**4.** more, less.